Snow Coverage Area for the Sierra Nevada –April 1, 2007

The following analysis of **S**now **C**overed **A**rea (SCA) is derived from MODIS (Moderate Resolution Imaging Spectroradiometer) aboard NASA's Terra and Aquas satellites. Data from MODIS are processed to provide a resolution of 500 meters and a fractional SCA product where each pixel can range in value between 0 and 100% (e.g. 50%=50% of the 500 meter pixel is covered by snow) as opposed to the operational binary product that defines a pixel as either snow or snow free. The MODIS SCA product is available on a daily basis, but viewable areas are subject to cloud cover. In addition, tree canopies mask a portion of the SCA and should be viewed accordingly based on the vegetation characteristics of each hydrologic unit and watershed.

This analysis covers the Sierra Nevada and various river basins, with Figure 1 highlighting the SCA over the Sierra Nevada and Figure 2 showing the change in SCA between February 28, 2007 and March 31, 2007. Figures 3 (a-d) focuses on the **American, Tuolumne, Merced, and Kaweah** River basins. Additional basins will be added throughout the year.

These data and analysis are made available by the University of California, Merced, University of California, Santa Barbara, and the National Snow and Ice Data Center (University of Colorado, Boulder) under *NASA Grant NNG04GC52 (REASoN CAN 'Multi-resolution snow products for the hydrologic sciences')*. For further information or comments/suggestions please contact Robert Rice (rrice@ucmerced.edu or (209)228-4397) or Roger Bales at University of California, Merced.

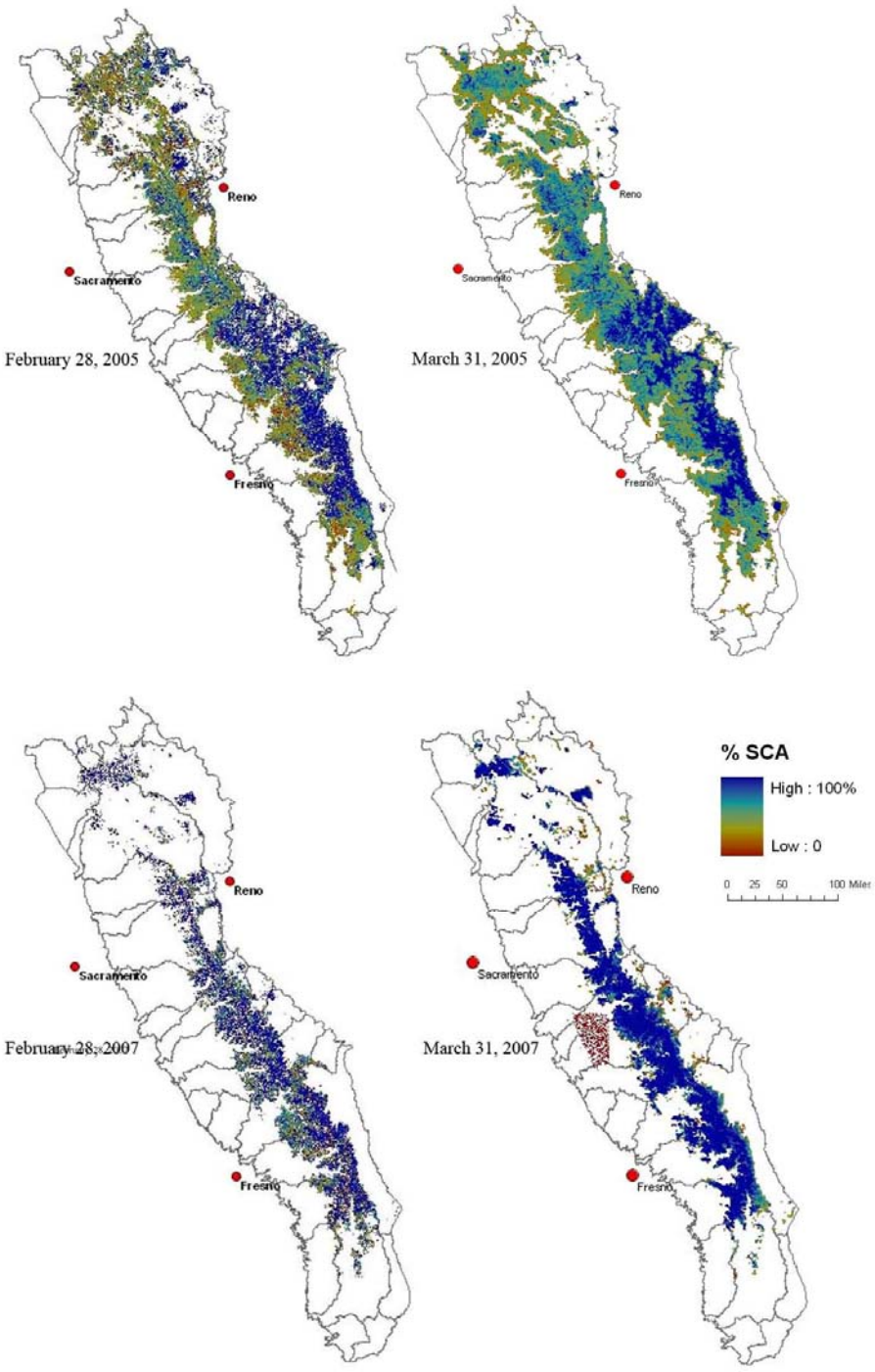


Figure 1. SCA over the **Sierra Nevada** on February 28 and March 31, 2005 and February 28 and March 31, 2007 outlined by the individual watersheds. Evident is the extent of snow cover between February and March of 2005 and 2007 in which the statewide snow water equivalent (SWE) on April 1, 2007 was 39% of the historical April 1 average (based on snow course date), while the April 1, 2005 was 137% of the April 1 average.

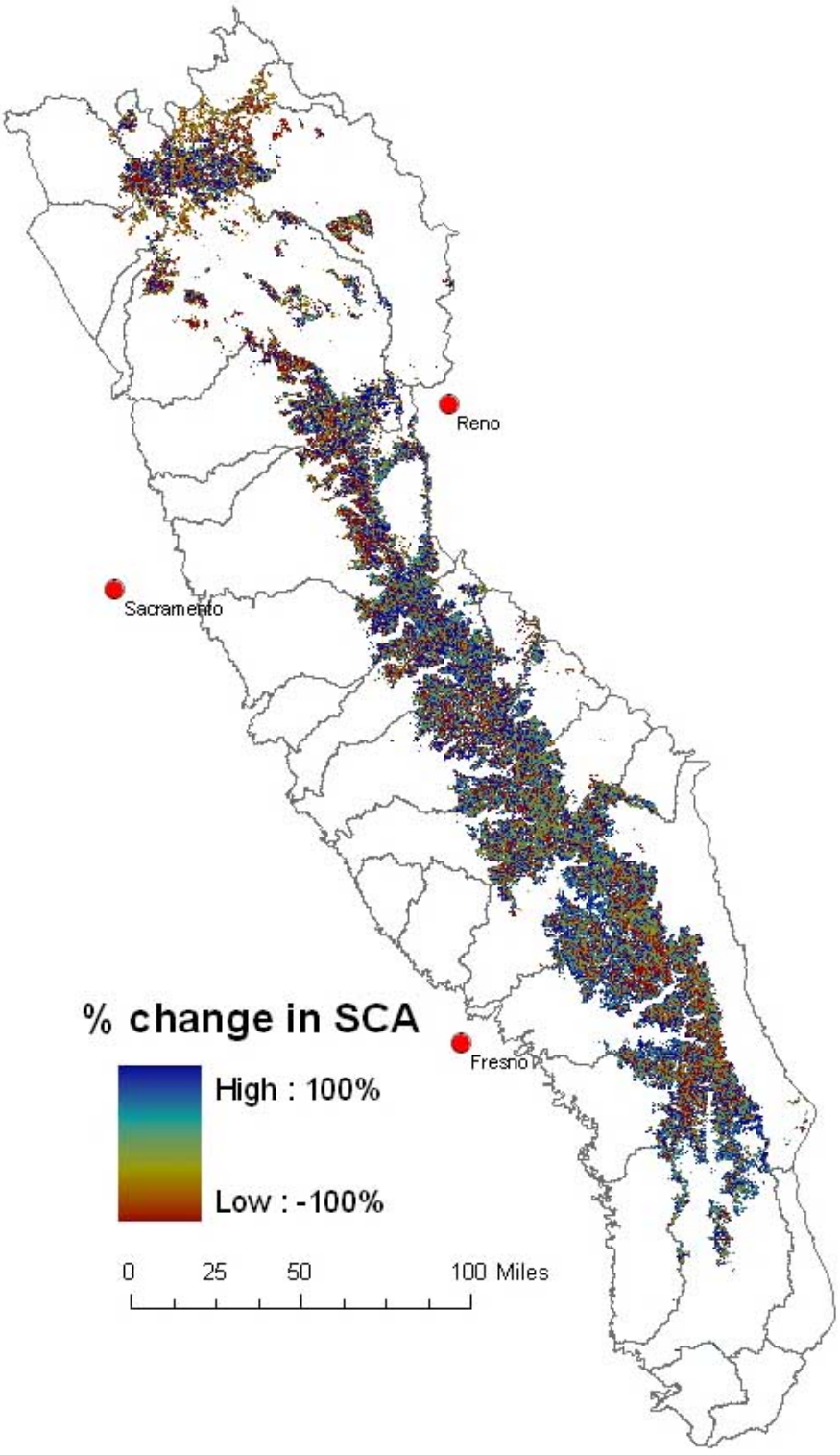
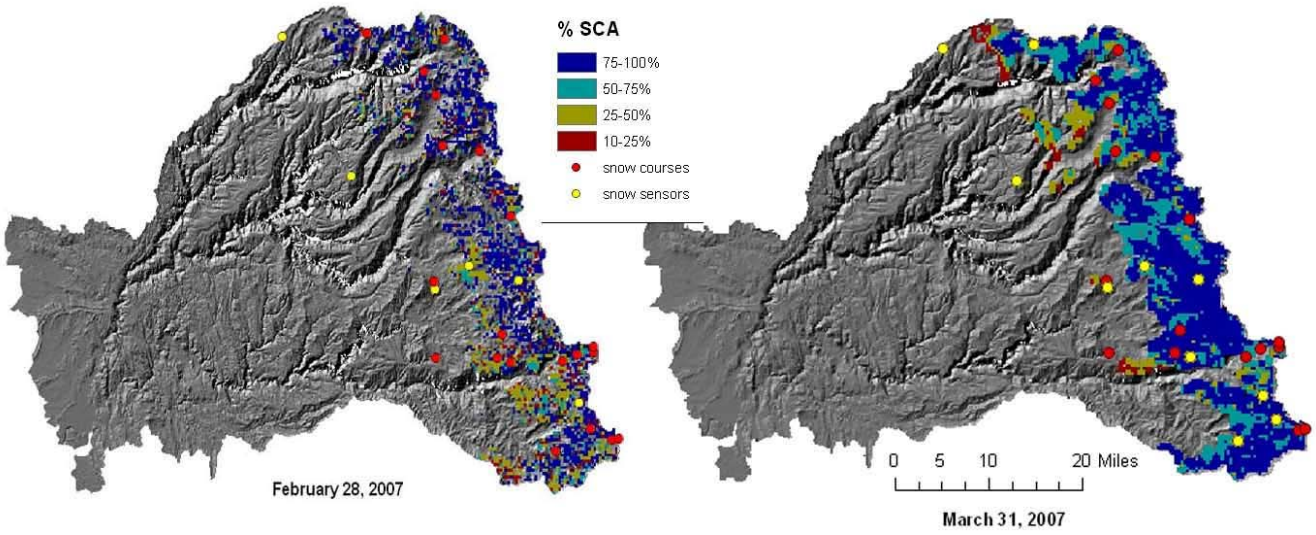
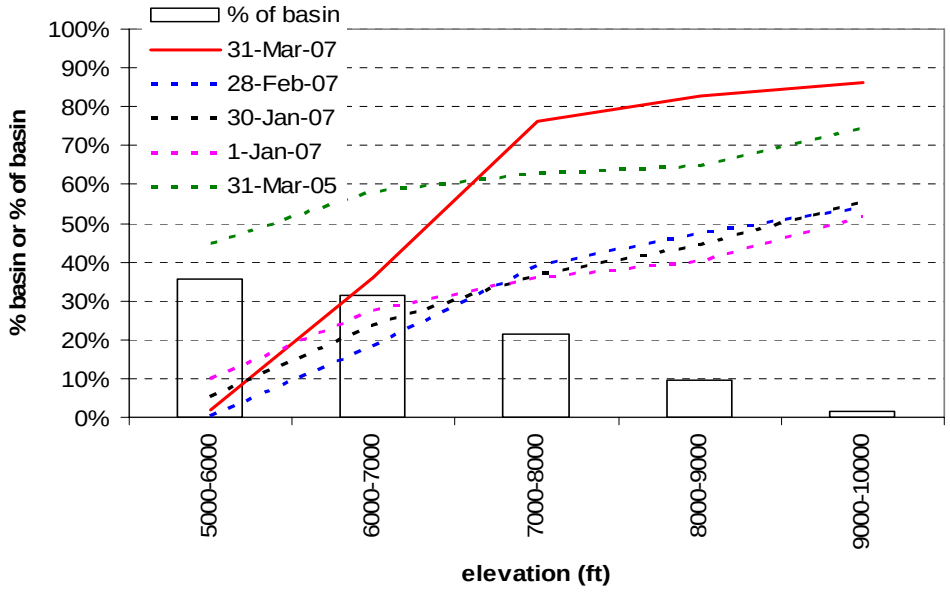


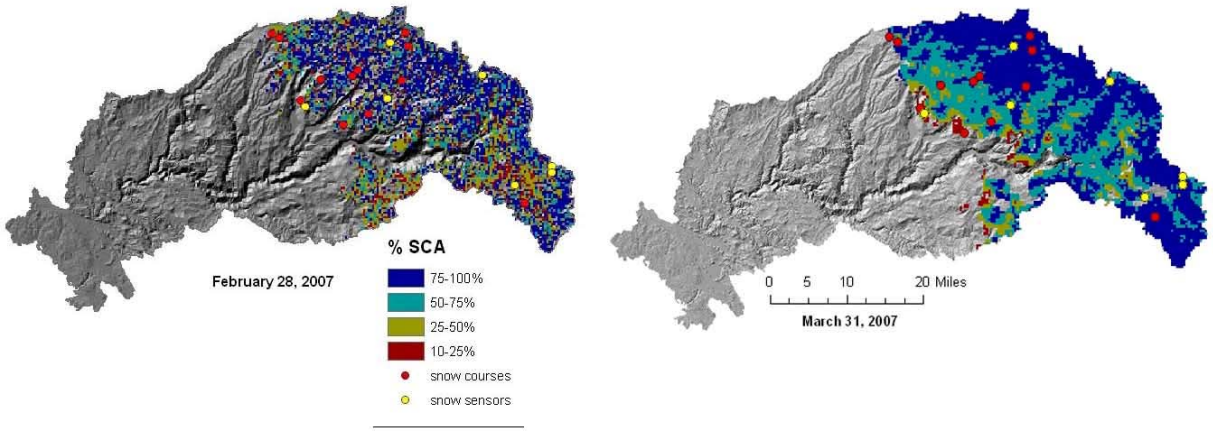
Figure 2. The graphic shows the change in SCA between February 28 and March 31, 2007 in which 100% represents an increase in SCA and -100% represents a decline in SCA across a 500 meter pixel.

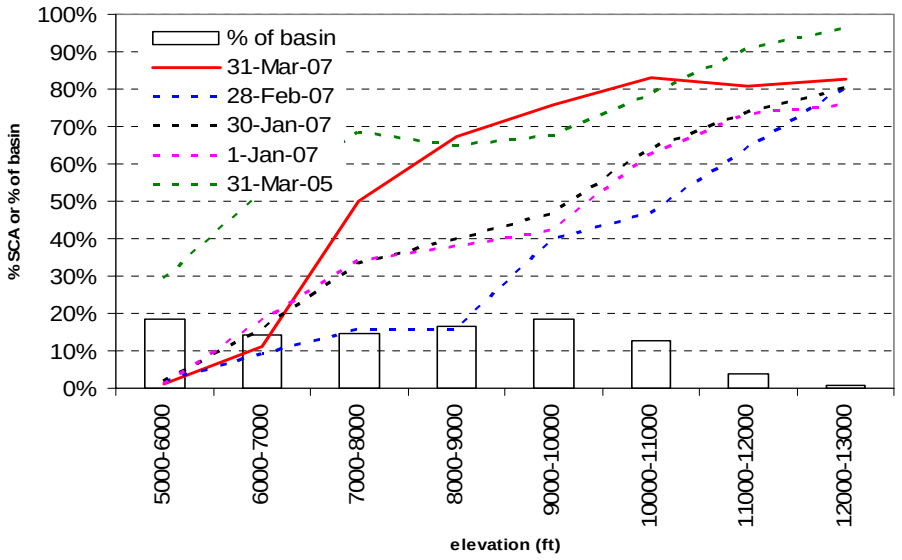




	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Mar 31, 2005
5000-6000	2%	0%	5%	10%	45%
6000-7000	36%	19%	24%	27%	58%
7000-8000	76%	39%	37%	36%	63%
8000-9000	83%	47%	44%	40%	65%
9000-10000	86%	54%	56%	52%	74%

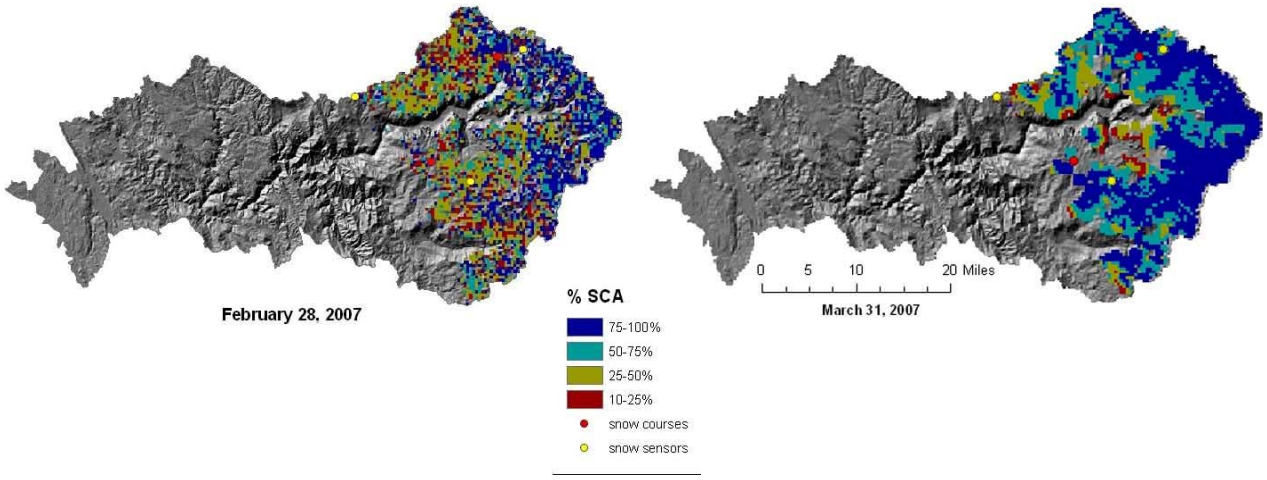
Figure 3(a). SCA over the **American River** Basin on February 28 and March 31, 2007. On March 1, 2007 basin-wide SWE was 76% of the March 1 historical average (based on basin-wide snow course data), while April 1, 2007 was 38% of the April 1 historical average. In addition, on April 1, 2005, SWE was 139% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the American River Basin from January – March 2007 and March 31, 2005.

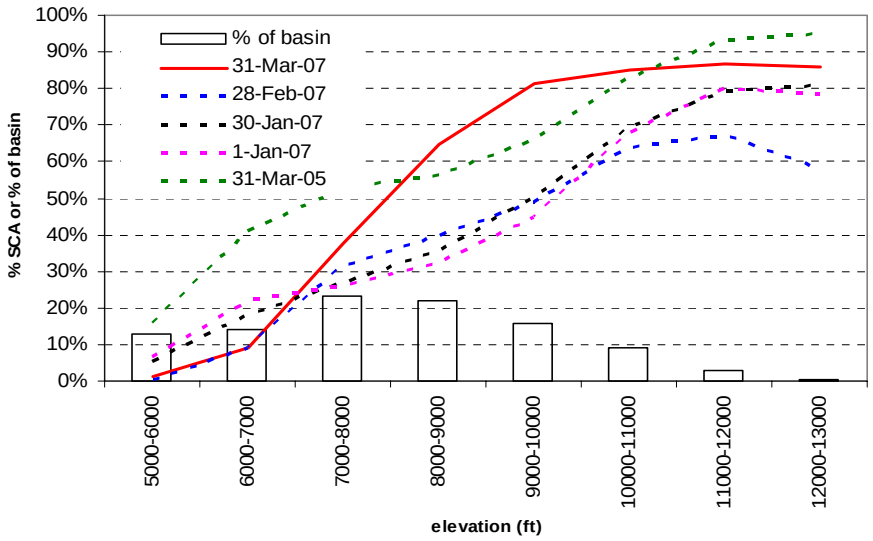




	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Mar 31, 2005
5000-6000	1%	2%	2%	1%	29%
6000-7000	11%	9%	16%	18%	52%
7000-8000	50%	16%	34%	34%	69%
8000-9000	67%	16%	40%	38%	65%
9000-10000	76%	40%	47%	42%	68%
10000-11000	83%	47%	64%	63%	79%
11000-12000	81%	64%	74%	74%	91%
12000-13000	83%	80%	80%	76%	97%

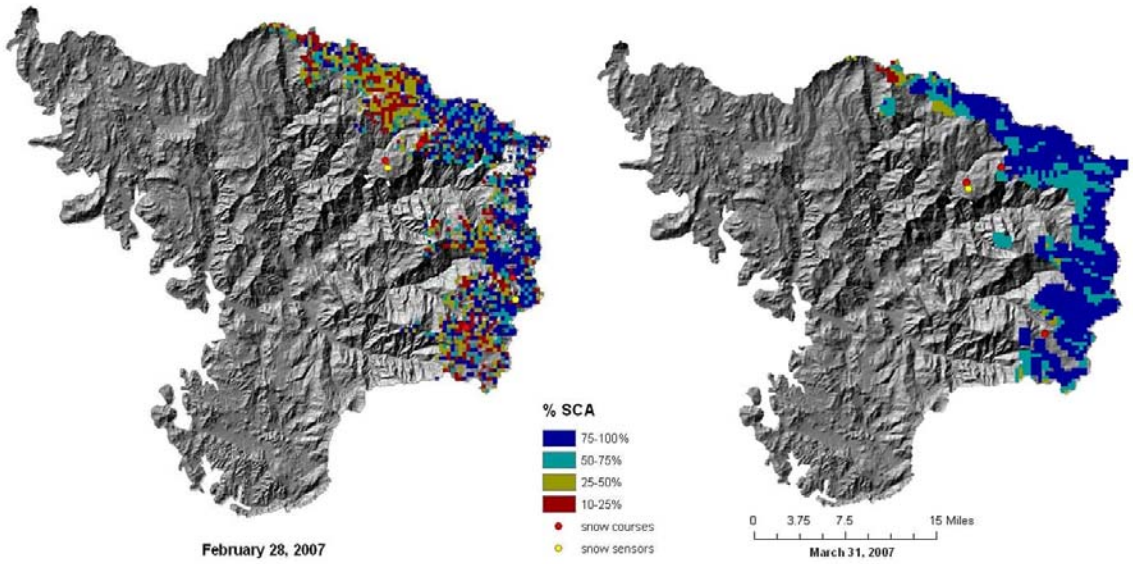
Figure 3(b). SCA over the **Tuolumne River** Basin on February 28 and March 31, 2007. On March 1, 2007 basin-wide SWE was 63% of the March 1 historical average (based on basin-wide snow course data), while April 1, 2007 was 46% of the April 1 historical average. In addition, on April 1, 2005, SWE was 163% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Tuolumne River Basin from January - March 2007 and March 31, 2005.

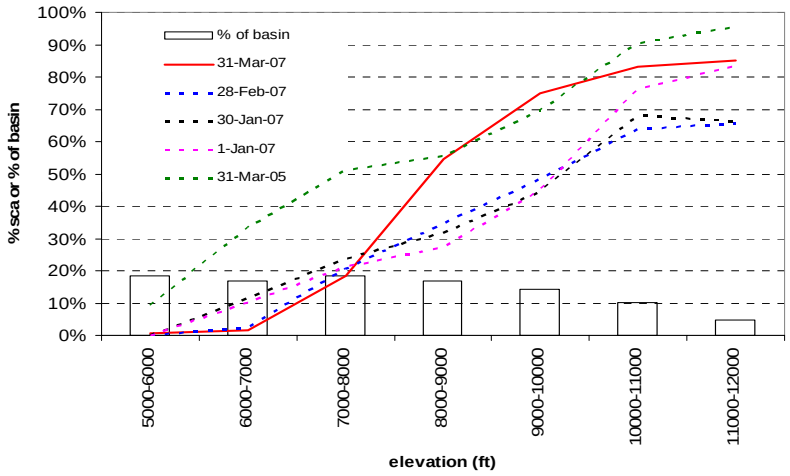




	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Mar 31 2005
5000-6000	1%	0%	6%	7%	16%
6000-7000	9%	9%	18%	22%	41%
7000-8000	38%	31%	27%	26%	53%
8000-9000	65%	40%	36%	32%	57%
9000-10000	81%	49%	50%	45%	66%
10000-11000	85%	64%	69%	68%	83%
11000-12000	87%	67%	79%	80%	94%
12000-13000	86%	58%	81%	78%	95%

Figure 3(c). SCA over the **Merced River** Basin on February 28 and March 31, 2007. On March 1, 2007 basin-wide SWE was 66% of the March 1 historical average (based on basin-wide snow course data), while April 1, 2007 was 45% of the April 1 historical average. In addition, on April 1, 2005, SWE was 163% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Merced River Basin from January - March 2007 and March 31, 2005.





	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Mar 31, 2005
5000-6000	1%	0%	0%	0%	9%
6000-7000	2%	2%	11%	10%	33%
7000-8000	18%	21%	24%	21%	51%
8000-9000	54%	35%	32%	27%	56%
9000-10000	75%	48%	44%	45%	70%
10000-11000	83%	64%	68%	76%	91%
11000-12000	85%	66%	66%	84%	96%

Figure 3(d). SCA over the **Kaweah River** Basin on February 28 and March 31, 2007. On March 1, 2007 basin-wide SWE was 86% of the March 1 historical average (based on basin-wide snow course data), while April 1, 2007 was 41% of the April 1 historical average. In addition, on April 1, 2005, SWE was 159% of the March 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Kaweah River Basin from January - March 2007 and March 31, 2005.